Reduce motorist delay

Signals

Pedestrians

Intersection Improvements

FM 518
Access Management Study

Access Management Conference

September, 2004

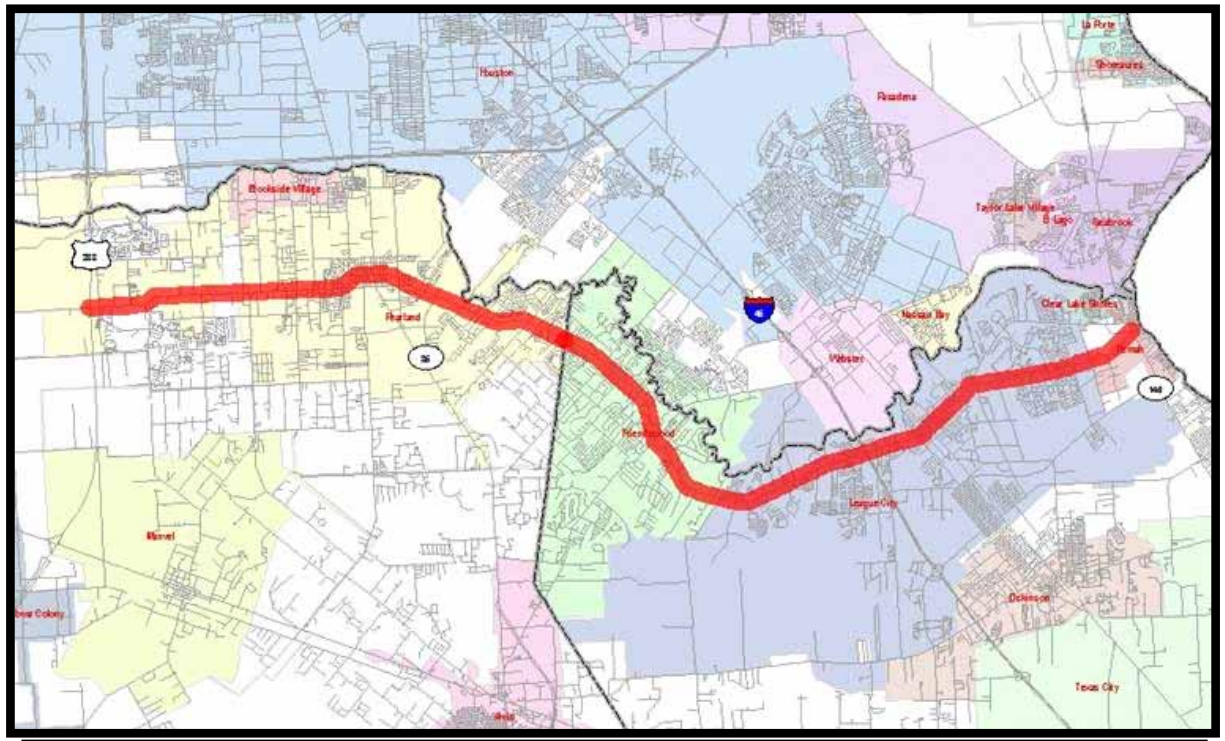
Safety

Project Description

FM 518 provides east-west mobility and access to many retail, commercial, residential and employment destinations.

- **Commissioned by Houston-Galveston Area Council**
- **Supported by the Cities of Pearland, Friendswood, League City and Kemah, TxDOT, and Brazoria and Galveston Counties, and various private entities.**

25.6 Miles, 4 lanes, TWLTL

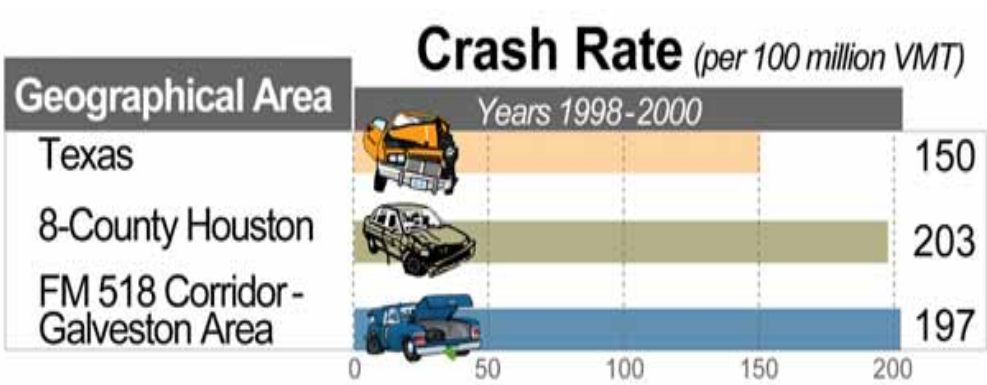


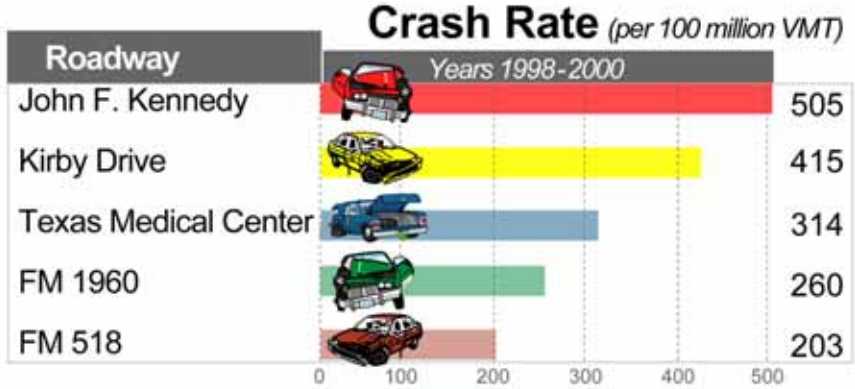
FM 518 intersects with four major north-south facilities such as US 288, SH 35, IH-45, and SH 146.

Study Process

- Twelve month study period
- Rational planning approach
- Public Involvement and Stakeholder meetings drove process

Current Corridor Conditions

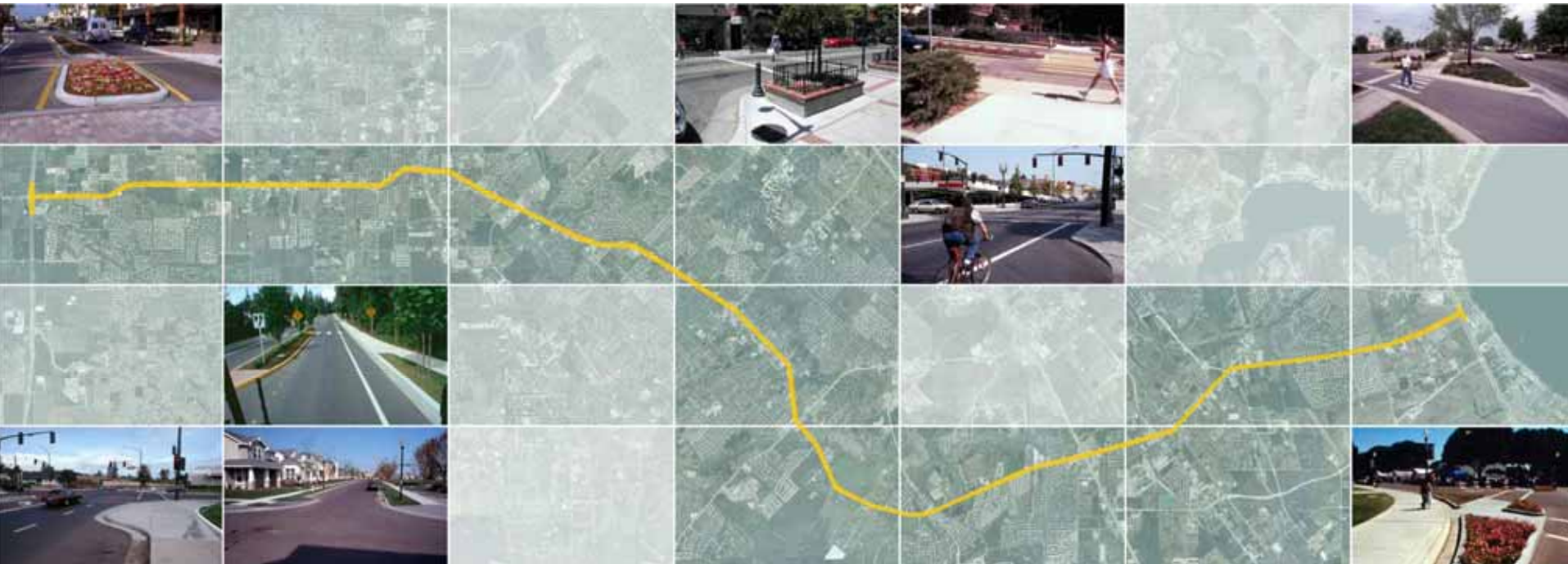




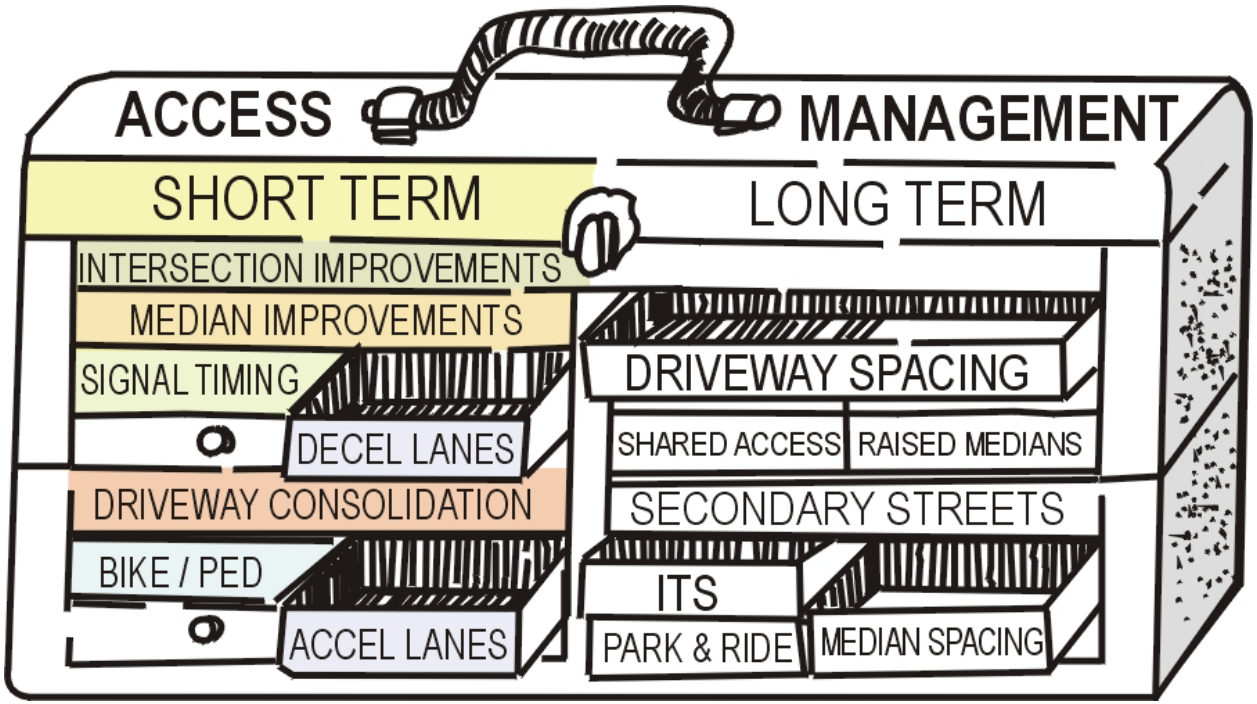
Corridor Sections			LOS	LOM
SH 288 West Side	to	FM 865 (Cullen)	E	Moderate
FM 865 (Cullen)		CR 89	E	Moderate
CR 89	to	Woody / Corrigan	F	Serious
Woody / Corrigan	to	Halbert / McLean	E	Moderate
Halbert / McLean	to	SH 35 / Main	F	Serious
SH 35 / Main	to	Sherwood	F	Serious
Sherwood	to	Woodcreek	F	Severe
Woodcreek	to	Dixie Farm	F	Serious
Dixie Farm	to	Williamsport	A - D	Tolerable
Williamsport	to	Newport	F	Serious
Newport	to	Interurban	F	Serious
Interurban	to	SH 3	F	Severe
SH 3	to	FM 270 / FM 2094	F	Serious
FM 270 / FM 2094	to	South Shore	F	Severe
South Shore	to	SH 146	A - D	Tolerable

Corridor Goals and Objectives

- Improve safety
- Improve traffic flow
- Reduce motorist delay
- Identify short-term transportation improvements
- Assess long-term corridor needs



Access Management Tools Defined for Corridor

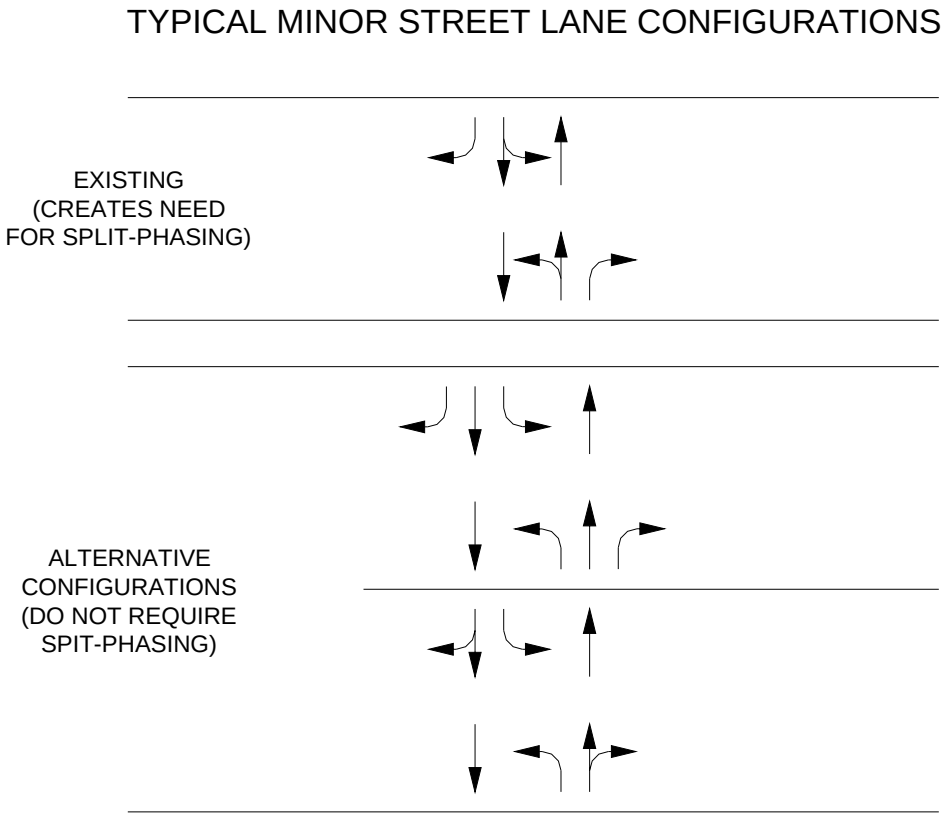


Identification of Operational Improvements

This process involved not only modeling recommended physical improvements such as left turn and right turn lanes but also, included optimizing the intersection phasing, timing, and offsets.

Over half (29) of the 58 signalized intersections along the corridor could be improved by a combination of adding right turn and/or left turn lanes and modifying signal timing.

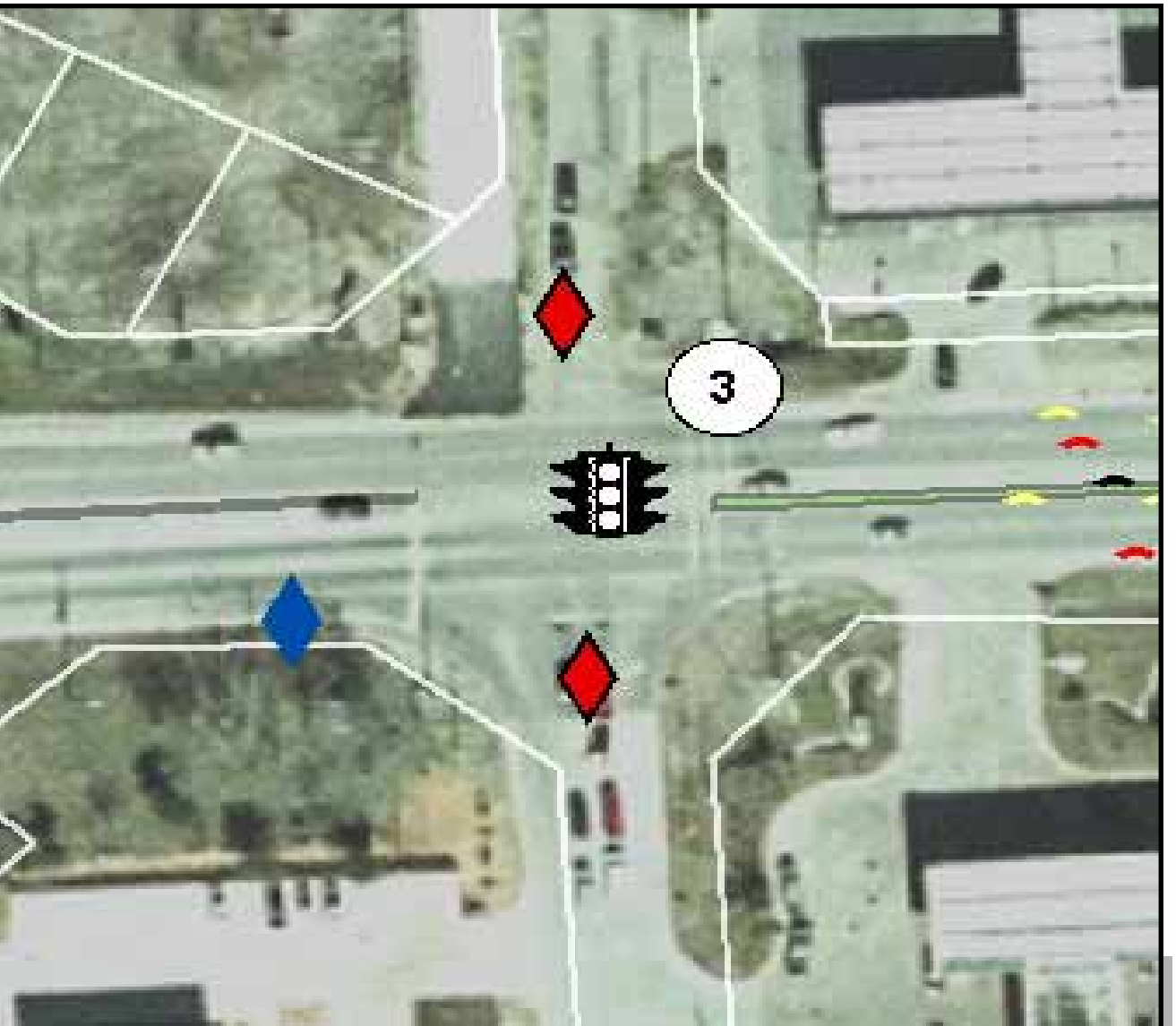
One Additional Lane Improves Intersection Operation



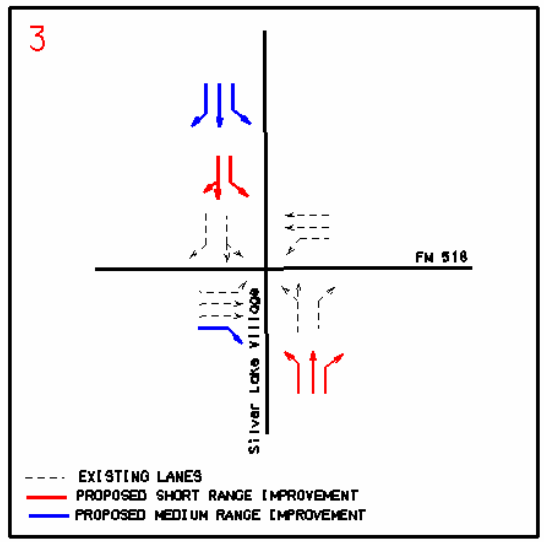
Intersection Improvements

- Dedicated Left-Turn and Right-Turn Lanes Reduce Platoon Disruption and Enhance Signal Operations
- Shortening Signal Cycle Length Reduces Driver Delay

Silverlake Village/CR 94A Signal 3



- Re-stripe NB and SB from left-only, left-or-straight, and right-only to left-only, straight-only, and right-only
- Change N-S signal sequence from split-phased to quad-left



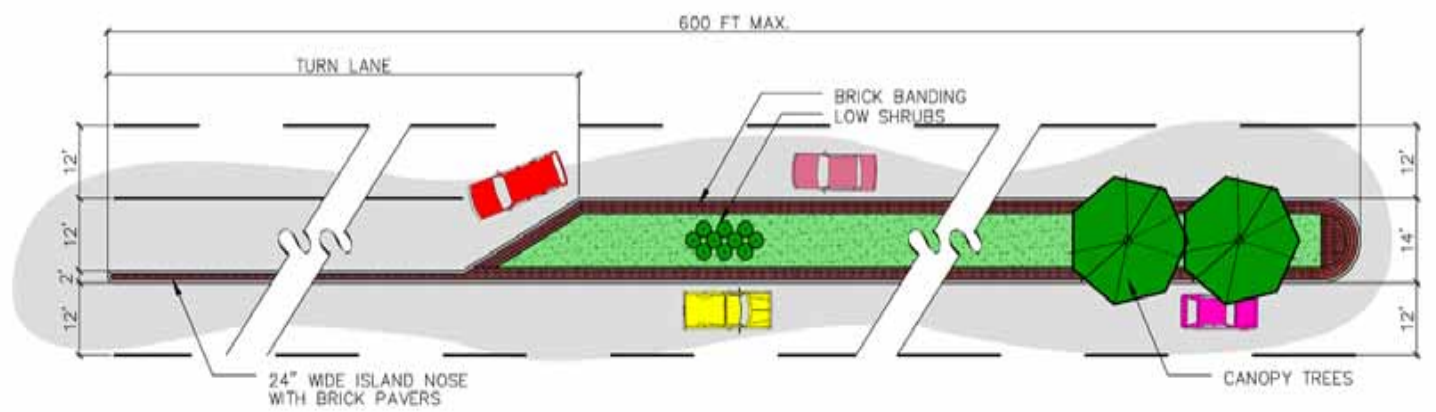
Signal System Recommendation

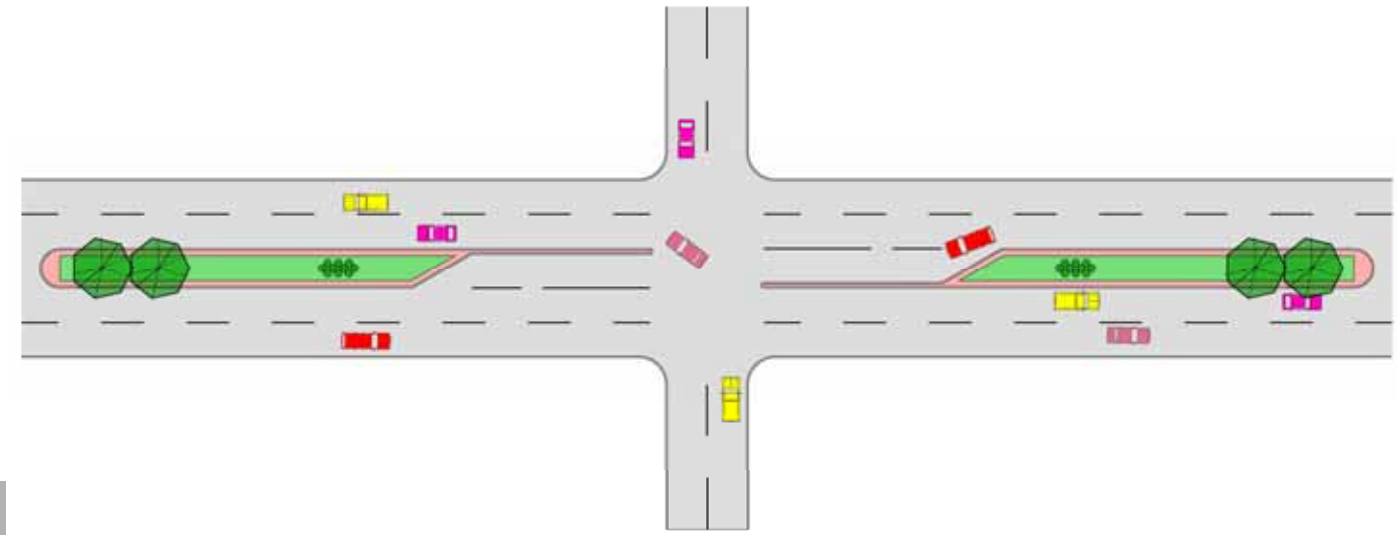
- The remaining isolated intersections should be incorporated into closed-loop systems.
- The timing of all of the systems should be optimized for current traffic.

Identification of Safety Improvements

GIS used to identify crash locations (hazards) and document access connections.

Application of Raised Medians





Characteristics of a short-term raised median recommendation

- Intersection with a high crash rate (>10)
- Adjacent land use has good alternative access ways (driveway on cross street)
- Adjacent land use has adequate internal circulation
- The addition of the raised median has limited safety benefits, but does contribute aesthetically to a gateway feature.

Medium-Term Raised Median Recommendations

- Intersection with a medium crash rate (>5)
- Adjacent land use has alternative access ways (multiple driveways).
- Adjacent land use has opportunity to share access with another development

Driveway Consolidation

- Consolidation Recommendations
  - Pearland - 103
  - Friendswood - 28
  - League City - 23

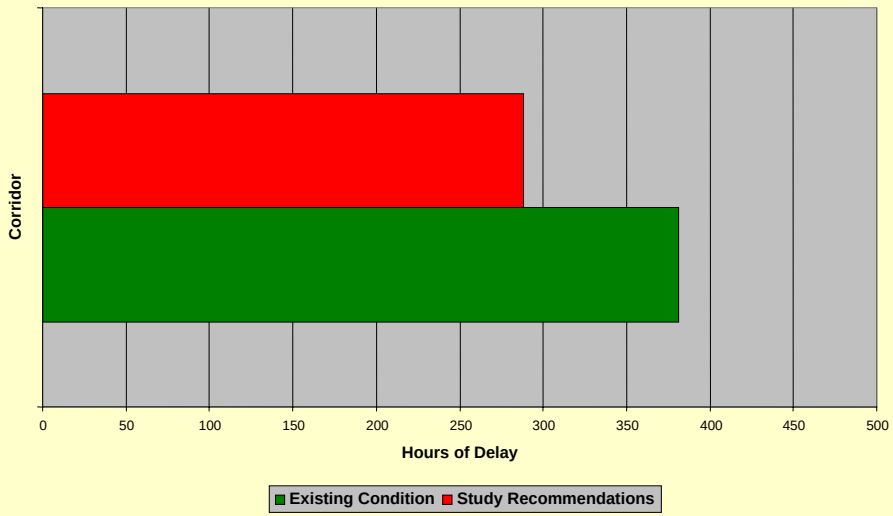
    Total - 155
- Opportunities to Consolidate
  - Addition of right-turn lane
  - Retrofit of property
  - Sidewalk, drainage and sewer projects

Results

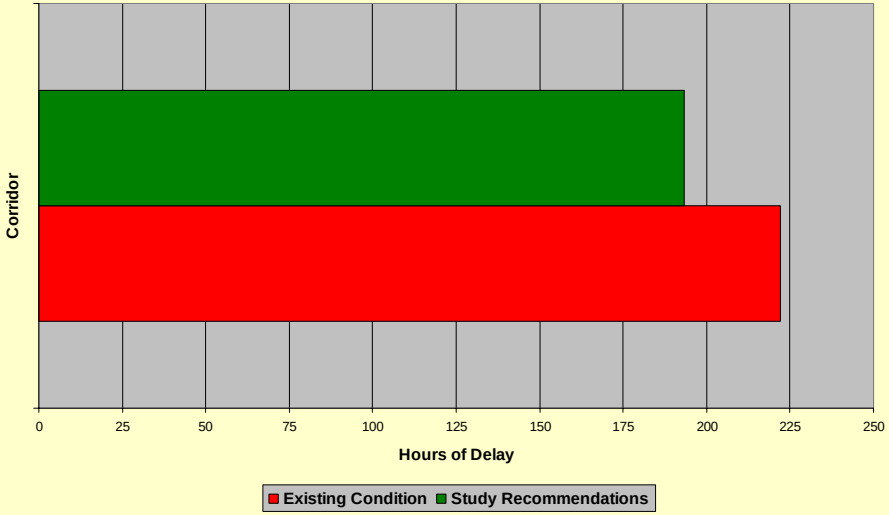
- Operational
- Safety
- Air Quality/Energy

Operational Benefits

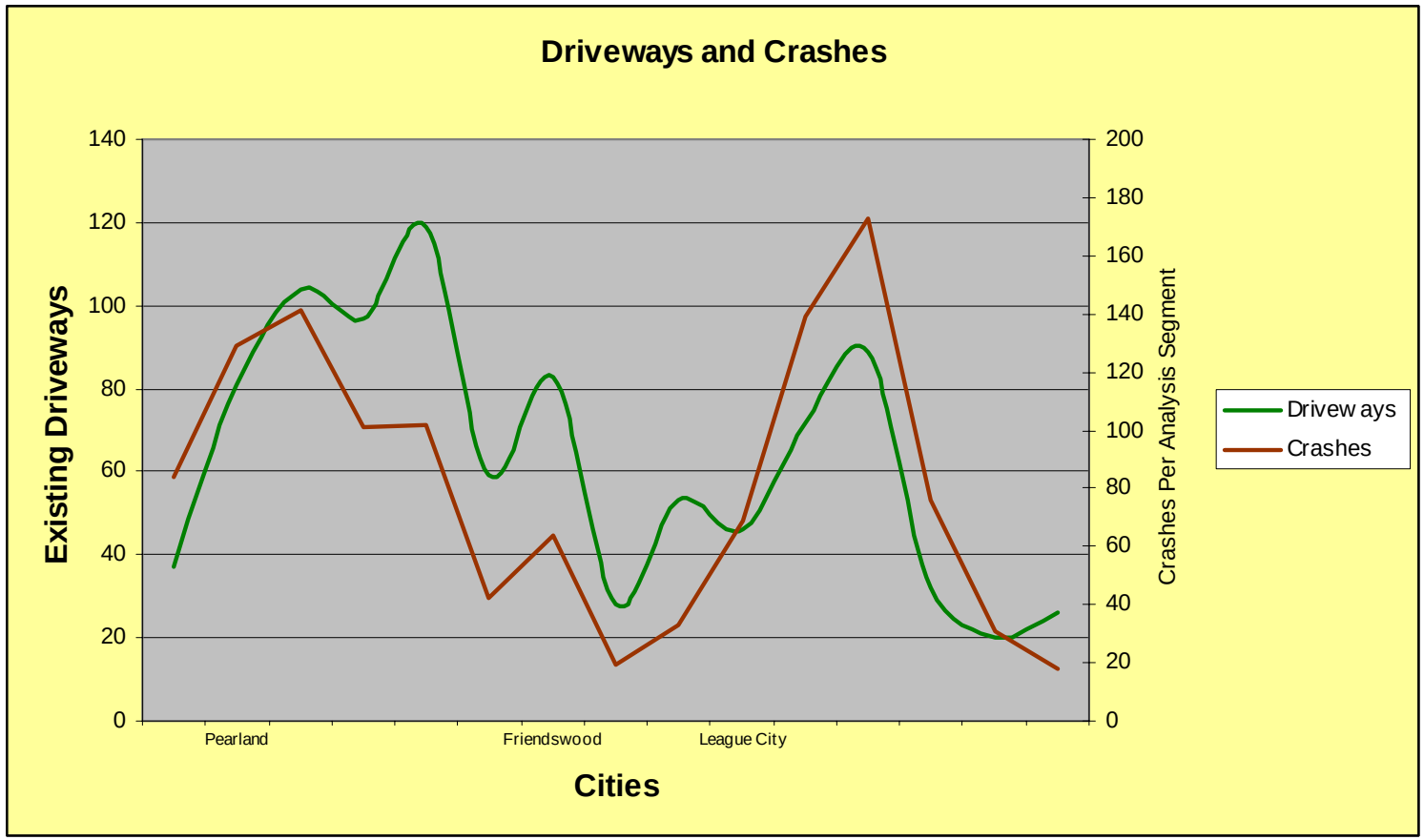
AM CORRIDOR TRAVEL TIME DELAY



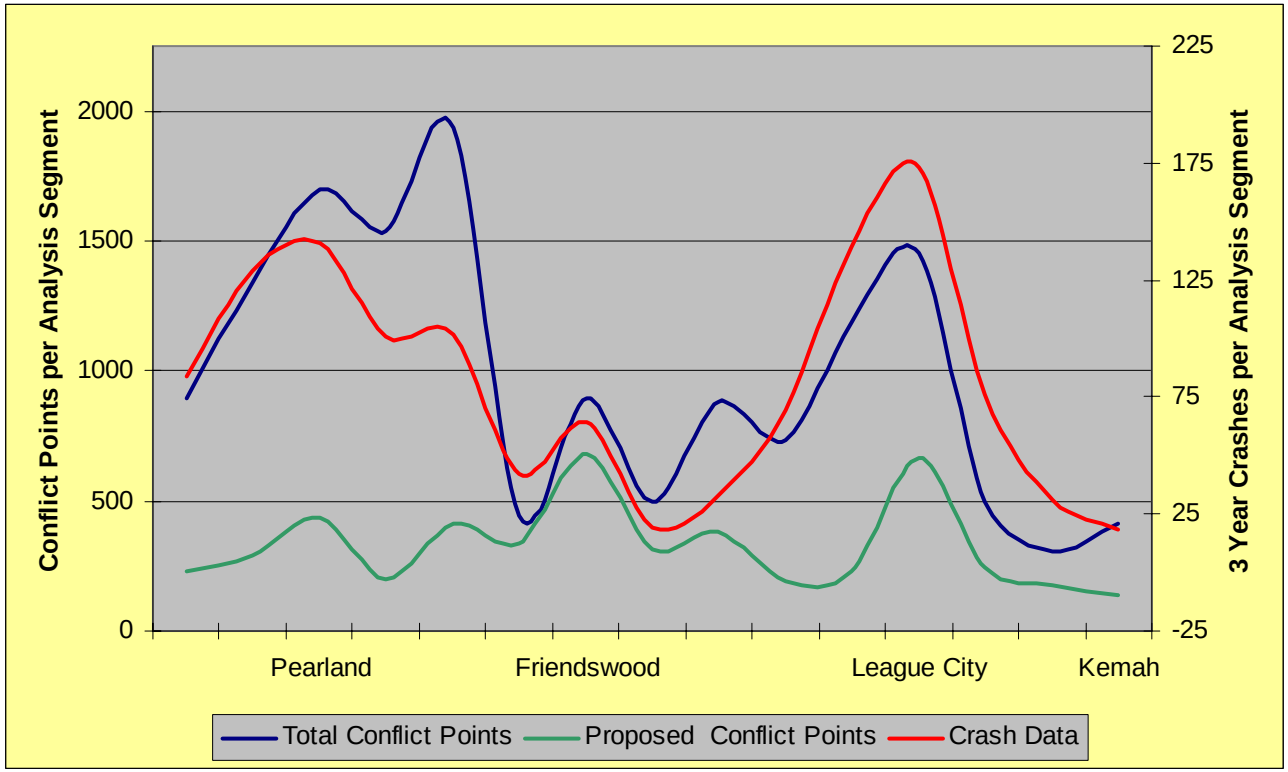
PM CORRIDOR DELAY COMPARISON



Driveways Related to Crashes



Conflict Points After Raised Median



Air Quality

Air Quality Benefits

Pollutant % Reduced

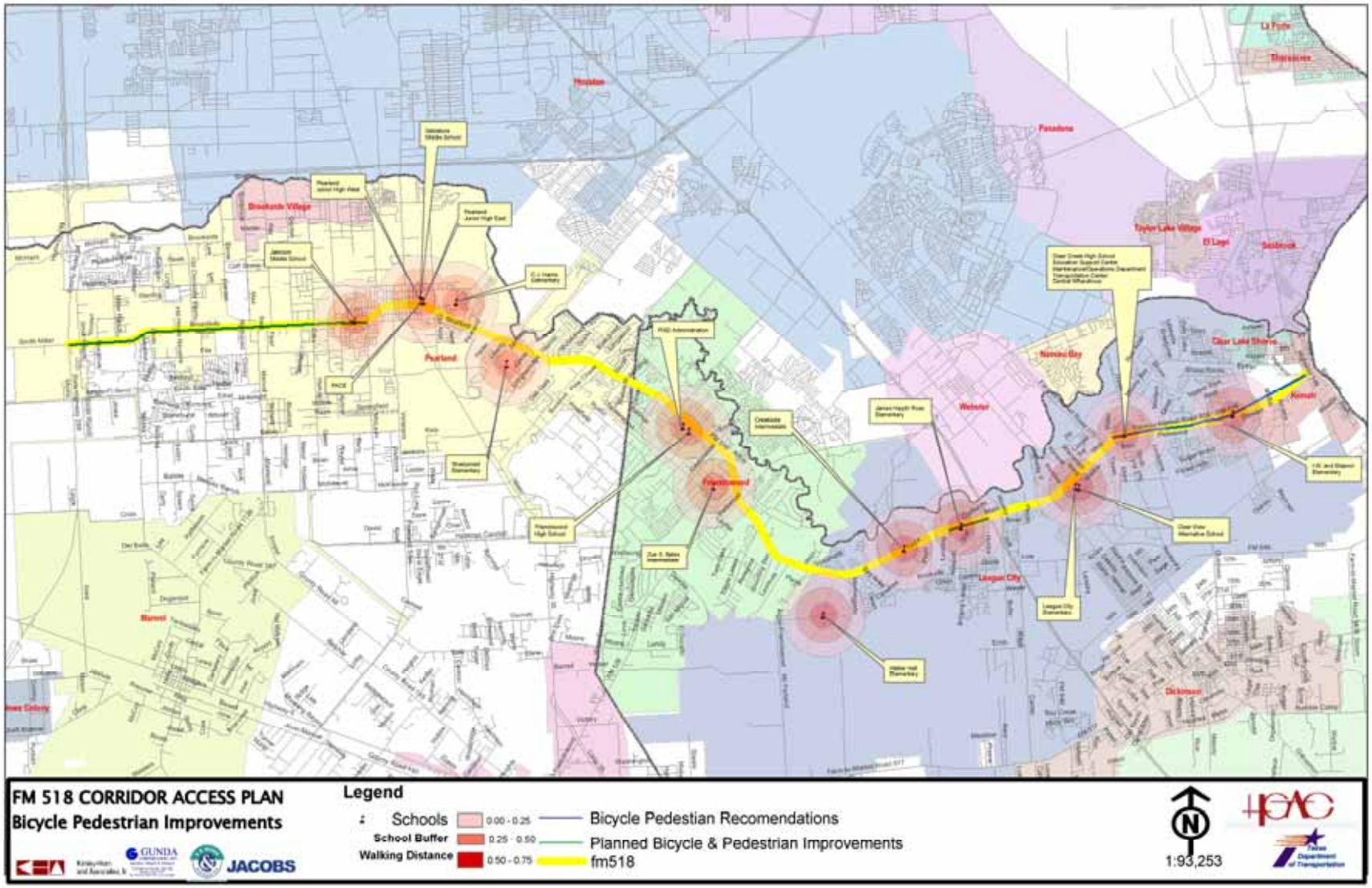
NOx = 37%

VOC = 34%

CO = 36%

NO.	City	AADT For Different Segments	Average AADT For Each City	Average Peak Period Traffic For Each City	Average Off-Peak Period Traffic For Each City	Nox	VOC	CO
						Grams/Day		
1	Pearland	24,000						
2	"	26,000						
3	"	28,000						
4	"	22,000						
5	"	26,000						
6	"	37,000						
7	"	30,000						
8	Pearland	21,000	26,750	11,503	15,248	260,471	249,167	2,274,221
9	Friendswood	16,100						
10	"	15,200						
11	"	11,700						
12	Friendswood	38,000	20,250	8,708	11,543	47,904	73,423	507,681
13	League City	38,000						
15	League City	31,000	34,500	14,835	19,665	138,037	167,049	1,371,037
15	Kemah	16,500						
16	"	9,100						
17	Kemah	10,300	11,967	5,146	6,821	75,100	74,665	712,458
Corridor Total		399,900	23,367	10,048	13,319	**521,512**	**564,304**	**4,865,397**

Bicycle/Pedestrian Improvements



Future Corridor Recommendations

Comprehensive Plan

- Chapter 213.001 of the Texas Municipal Code
- Access Management Goal Statement

Zoning Ordinance

- Chapter 211.001 of the Texas Municipal Code
- Compliment Access Management Standards

Subdivision Ordinance

- Chapter 213.001 of the Texas Municipal Code
- Access Management Guidelines

Comprehensive Plans

- Establish general policy on access management.
- More specific statement:
  - The FM 518 corridor is to be planned, designed and managed in accordance with the FM 518 Corridor Access Management Plan.
- Activity center strategies vs. strip development

Comprehensive Plans

- Use of parallel roads, side streets, and cross access easements connecting adjacent developments.
- Properties under the same ownership, consolidated for development, or part of phased development plans shall be considered one property for the purposes of access management.
- New residential subdivisions should include an internal street layout that connects to the streets of surrounding developments
- Commercial development should be encouraged to share common access connections as well as to provide a convenient system of interparcel circulation.

Thoroughfare Plans

- Establish street hierarchy
- Designate public right-of-way to mitigate impacts to the functional integrity of FM 518 and other major arterials.
- Limit direct access to major thoroughfares
- Establish access management policies guidelines

Land Use Recommendations

- Subdivision Regulations
  - Establish cross and shared access provisions
  - Establish minimum connection spacing requirements
  - Minimum lot frontages
  - Discourage residential access on major thoroughfares
- Zoning
  - Discourage shallow strip development with no alternative access
  - Overlay zones

FM 518 Minimum Connection Spacing	
Posted Speed (mph)	Distance (ft)
≤ 30	200
35	250
40	305
45	360
≥ 50	425

Action Plan

	Agency
Policy board approval of study	H-GAC
Adopt FM 518 Corridor Access Plan by ordinance	Cities
Secure funding for short-term intersection improvements	H-GAC and TxDOT
Implement intersection improvements	TxDOT
Implement system-wide signal retiming	TxDOT and Cities
Secure funding for median improvements	H-GAC and TxDOT
Implement median improvements	TxDOT
Coordinate with TxDOT for median aesthetics	Cities
Identify funding and implement pedestrian / bike improvements	H-GAC, TxDOT, and Cities
Program long range thoroughfare improvements	Cities
Update comprehensive plans and subdivision standards	Cities